We Claim:

1. A method for generating a composite EM field to carry a signal to at least two terminals, the method comprising the step of directing energy in a plurality of directions, the amount of energy directed in the direction of each of the terminals being a function of the locations and acceptable receive strengths of at least two of the terminals.

2. The method of claim 1, wherein the function is such that a strength of the EM field at the location of any of the at least two terminals is at least as large as, but not significantly larger than, needed for that terminal to receive the signal carried by the EM field with an acceptable level of signal quality.

3. The method of claim 1, wherein the directing step comprises the steps of:

determining for each one of the terminals an EM field that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat, the determining taking into account the strength, at the location of the one terminal, of EM fields previously determined for others of the terminals;

repeating the first determining step until the EM fields determined for the at least two of the terminals provide an EM field strength for each of the at least two of the terminals that is substantially equal to its adequate receive strength; and

determining the amount of energy to be directed in the direction of each of the terminals based on the EM fields thus determined.

4. The method of claim 3, wherein:

each EM field being represented by one of a plurality of beam-patterns;

the first determining step comprises determining for each one of the terminals a beam pattern that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat, the determining taking into account the EM field strength, at the location of the one terminal, of beam-patterns previously determined for others of the terminals; and

the repeating step comprises repeating the first determining step until the beam-patterns determined for the at least two of the terminals provide an EM field strength for each of the at least two of the terminals that is substantially equal to its adequate receive strength.

5. The method of claim 4, wherein:

the beam-patterns being voltage beam patterns;

the acceptable receive strength being an acceptable receive voltage; and

the adequate receive strength being an adequate receive voltage.

6. The method of claim 4, wherein one of a plurality of weight vectors corresponds to each of the beam-patterns, and the second determining step comprises the steps of:

determining a composite weight vector using the plurality of weight vectors, and a null-filling factor;

determining a composite beam-pattern using the composite weight vector, the composite beam-pattern representing the composite EM field; and

determining the amount of energy to be directed in the direction of each of the terminals based on the composite EM field.

7. The method of claim 1, wherein the directing step comprises the steps of:

determining for each one of the terminals an EM field that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat if that one terminal was the only terminal that needed to receive the signal;

determining a scaling factor for each EM field such that each EM field, associated with the at least two terminals, scaled by its scaling factor provides an EM field strength at the location of each of these at least two terminals that is substantially equal to its adequate receive strength;

scaling each EM field, associated with the at least two terminals, by its scaling factor; and

determining the amount of energy to be directed in the direction of each of the terminals based on the EM fields thus determined.

8. The method of claim 1, wherein the direction is an azimuth direction.

9. The method of claim 1, further comprising the step of transmitting the energy.

10. A transmitter operable to generate a composite EM field to carry a signal to at least two terminals by directing energy in a plurality of directions, the amount of energy directed in the direction of each of

the terminals being a function of the locations and acceptable receive strengths of at least two of the terminals.

11. The transmitter of claim 10, wherein the function is such that a strength of the EM field at the location of any of the at least two terminals is at least as large as, but not significantly larger than, needed for that terminal to receive the signal carried by the EM field with an acceptable level of signal quality.

12. The transmitter of claim 10, further comprising a processor operable to:

determine for each one of the terminals an EM field that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat, the determining taking into account the strength, at the location of the one terminal, of EM fields previously determined for others of the terminals;

repeat the first determining until the EM fields determined for the at least two of the terminals provide an EM field strength for each of the at least two of the terminals that is substantially equal to its adequate receive strength; and

determine the amount of energy to be directed in the direction of each of the terminals based on the EM fields thus determined.

13. The transmitter of claim 12, wherein:

each EM field being represented by one of a plurality of beam-patterns;

the first determining comprises determining for each one of the terminals a beam pattern that would have to be generated for the one

terminal in order to provide an acceptable receive strength thereat, the determining taking into account the EM field strength, at the location of the one terminal, of beam-patterns previously determined for others of the terminals; and

the repeating comprises repeating the first determining until the beam-patterns determined for the at least two of the terminals provide an EM field strength for each of the at least two of the terminals that is substantially equal to its adequate receive strength.

14. The transmitter of claim 13, wherein:

the beam-patterns being voltage beam patterns;

the acceptable receive strength being an acceptable receive voltage; and

the adequate receive strength being an adequate receive voltage.

15. The transmitter of claim 13, wherein one of a plurality of weight vectors corresponds to each of the beam-patterns, and the second determining comprises:

determining a composite weight vector using the plurality of weight vectors, and a null-filling factor;

determining a composite beam-pattern using the composite weight vector, the composite beam-pattern representing the composite EM field; and

determining the amount of energy to be directed in the direction of each of the terminals based on the composite EM field.

16. The transmitter of claim 10, further comprising a processor operable to:

determine for each one of the terminals an EM field that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat if that one terminal was the only terminal that needed to receive the signal;

determine a scaling factor for each EM field such that each EM field, associated with the at least two terminals, scaled by its scaling factor provides an EM field strength at the location of each of these at least two terminals that is substantially equal to its adequate receive strength;

scale each EM field, associated with the at least two terminals, by its scaling factor; and

determine the amount of energy to be directed in the direction of each of the terminals based on the EM fields thus determined.

17. The method of claim 10, wherein the direction is an azimuth direction.

18. An system comprising a transmitter operable to generate a composite EM field to carry a signal to at least two terminals by directing energy in a plurality of directions, the amount of energy directed in the direction of each of the terminals being a function of the locations and acceptable receive strengths of at least two of the terminals.

19. The system of claim 18, wherein the function is such that a strength of the EM field at the location of any of the at least two terminals is at least as large as, but not significantly larger than, needed for that terminal to receive the signal carried by the EM field with an acceptable level of signal quality.

20. The system of claim 18, further comprising a processor coupled to the transmitter, the processor operable to:

determine for each one of the terminals an EM field that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat, the determining taking into account the strength, at the location of the one terminal, of EM fields previously determined for others of the terminals;

repeat the first determining until the EM fields determined for the at least two of the terminals provide an EM field strength for each of the at least two of the terminals that is substantially equal to its adequate receive strength; and

determine the amount of energy to be directed in the direction of each of the terminals based on the EM fields thus determined.

21. The system of claim 20, wherein the processor being located in the transmitter.

22. The system of claim 20, wherein the system is a wireless communication system having at least one MSC, and the processor being located in the MSC.

23. The system of claim 20, wherein:

each EM field being represented by one of a plurality of beam-patterns;

the first determining comprises determining for each one of the terminals a beam pattern that would have to be generated for the one terminal in order to provide an acceptable receive strength thereat, the determining taking into account the EM field strength, at the location of

the one terminal, of beam-patterns previously determined for others of the terminals; and

the repeating comprises repeating the first determining until the beam-patterns determined for the at least two of the terminals provide an EM field strength for each of the at least two of the terminals that is substantially equal to its adequate receive strength.

24. The system of claim 23, wherein:

the beam-patterns being voltage beam patterns;

the acceptable receive strength being an acceptable receive voltage; and

the adequate receive strength being an adequate receive voltage.

25. The system of claim 23, wherein one of a plurality of weight vectors corresponds to each of the beam-patterns, and the second determining comprises:

determining a composite weight vector using the plurality of weight vectors, and a null-filling factor;

determining a composite beam-pattern using the composite weight vector, the composite beam-pattern representing the composite EM field; and

determining the amount of energy to be directed in the direction of each of the terminals based on the composite EM field.

26. The system of claim 18, further comprising a processor coupled to the transmitter, the processor operable to:

determine for each one of the terminals an EM field that would have to be generated for the one terminal in order to provide an

acceptable receive strength thereat if that one terminal was the only terminal that needed to receive the signal;

determine a scaling factor for each EM field such that each EM field, associated with the at least two terminals, scaled by its scaling factor provides an EM field strength at the location of each of these at least two terminals that is substantially equal to its adequate receive strength;

scale each EM field, associated with the at least two terminals, by its scaling factor; and

determine the amount of energy to be directed in the direction of each of the terminals based on the EM fields thus determined.

27. The system of claim 18, further comprising an antenna operable to transmit the energy.

28. The system of claim 27, wherein the antenna is a phased-array antenna.

29. The system of claim 18, the system being a base station and the terminals being mobile terminals.

30. The system of claim 18, the system being a wireless communication system and the terminals being mobile terminals.

31. The method of claim 18, wherein the direction is an azimuth direction.